FOR ARGUMENT

Supreme Court, U. S.
FILED
APR 6 1978
MICHAEL RODAK, JR., CLERK

IN THE

Supreme Court of the United States

OCTOBER TERM, 1977.

No. 77-642

LUTRELLE F. PARKER, ACTING COMMISSIONER OF PATENTS AND TRADEMARKS,

Petitioner,

vs.

DALE R. FLOOK,

Respondent.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF CUSTOMS AND PATENT APPEALS.

RESPONDENT'S BRIEF.

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April 6, 1978

Gunthorp-Warren Printing Company, Chicago • Financial 6-6565

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RESPONDENT'S BRIEF.

THE CONSTITUTIONAL PROVISIONS, STATUTES AND REGULATIONS INVOLVED.

For the convenience of the Court and Counsel, the relevant constitutional, statutory and regulatory provisions are set forth in full text in the Appendix which appears at the conclusion of this brief.

SUMMARY OF ARGUMENT.

The respondent, Dale R. Flook (hereinafter called "the applicant") applied for a patent on a new method for more reliably monitoring the values of process variables in a catalytic hydrocarbon conversion facility, in order to signal the occurrence of abnormal and perhaps dangerous conditions. The Court below

held that the method claimed was patentable subject matter within the meaning of 35 U. S. C. § 101.

The Acting Commissioner of Patents and Trademarks, Lutrelle F. Parker (hereinafter called "the Commissioner") seeks a reversal, contending that (1) the patent applicant's sole inventive contribution is a mathematical algorithm to be conventionally implemented; (2) the decision of the Court below is inconsistent with well-settled judicial interpretation of the patent statute; and (3) changing the standards of patentability to permit the patenting of computer applications of mathematical algorithms would raise serious problems and impose a substantial additional burden on the Patent Office.

To bypass the "burden" of examining the applicant's invention on its merits, the Commissioner asks the Court to declare the applicant's invention unpatentable solely on the basis of Section 101 of the Patent Act. The Commissioner ignores the fact that Section 101 is only one part of an overall statutory structure. Section 101 enumerates the *categories* of subject matter (*i.e.*, "process, machine, manufacture, or composition of matter, or any new and useful improvement thereof") which may be patented *if* the various tests of novelty set forth in Section 102, *and* the test of non-obviousness set forth in Section 103, are met. The Commissioner, in effect, asks this Court to rewrite Section 101 to include a test of inventiveness which was not intended to be included within the purview of its simple and unambiguous language.

The Commissioner has not inadvertently confused the intended purposes of Sections 101, 102 and 103, but has deliberately relied upon this confusion, and upon a collection of dicta which predates the 1952 Patent Act and which in no sense represents "well-settled judicial interpretation of the patent statute," to avoid the statutory duty which Congress has placed upon his agency.

The statutory scheme for insuring that bad patents don't issue demands that the Patent Office examine inventions to insure

that they meet all the tests of patentability before a patent is granted. As this Court said in *Graham* v. *John Deere Co.*:

> It is the duty of the Commissioner of Patents and of the courts in the administration of the patent system to give effect to the constitutional standard [Art. 1, Sec. 8] by appropriate application, in each case, of the statutory scheme of the Congress.
>
> . . .
>
> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.
>
> . . .
>
> It must be remembered that the primary responsibility for sifting out unpatentable material lies in the Patent Office.

383 U. S. 1 at 6-18.

The Commissioner would have the applicant's invention here peremptorily declared unpatentable for implied Section 103 reasons, without properly following the examination procedure demanded by Section 103. Applicant is entitled to have his invention tested under the plain language of the statute, rather than under an arbitrary and erroneous misuse of the statute for reasons of administrative convenience.

In the Commissioner's view, applicant's invention should not be patented because it is said to embody a "mathematical principle". Based on an unjustified interpretation of this Court's limited holding in *Gottschalk* v. *Benson*, 409 U. S. 63 (1972), and aided by a confused view of Sections 101, 102 and 103, the Commissioner's flawed logic leads to a misstatement of existing law:

> It is axiomatic that an abstract idea such as a mathematical formula is not itself patentable. Moreover, a process or

> method that incorporates a new abstract principle in a way that is conventional in light of existing technology is not patentable. Instead, to be patentable, embodiments of scientific or mathematical principles must be implemented in an inventive manner.

Brief for the Petitioner, Summary of Argument at 9.

Of course an "abstract idea" is not patentable; it is clearly not a "process, machine, manufacture or composition of matter . . ." as required by Section 101. But to assert, as the Commissioner does, that *Section 101 alone* prohibits a new idea from forming the basis for a patentable invention, *unless "implemented in an inventive manner"*, cannot be supported by the clear and simple language of Section 101. Once a "new idea" is implemented in some form falling within a Section 101 category, then patentability is substantively determined by the conditions of Sections 102 and 103.

The Commissioner proposes instead to re-legislate Section 101 to include a requirement clearly not intended by Congress and in direct conflict with the remainder of the Act. The Commissioner states that:

> To merit monopoly protection, it is not sufficient that a claim embody a concrete, tangible application of a mathematical or scientific principle; it must also extend beyond the routine, conventional, or uninventive applications that follow once the applicant possesses the idea.

Brief for the Petitioner at 19.

The Commissioner's proposed rule is unlikely to find favor with those inventors who necessarily complete their creative thinking before they physically implement their inventions.

ARGUMENT.

I. Applicant's Invention Is Statutory Subject Matter Under Section 101 of the Patent Act.

The issue before this Court is whether or not the subject matter claimed by the patent applicant Flook properly falls within one of the statutory categories of inventions that may be patented, as defined by 35 U. S. C. § 101 (1952). Since the Court should not be asked to establish principles or guidelines in the abstract, it is essential first to define the invention in issue here. Simply stated, it is: "A method for updating the values of alarm limits on process variables involved in a process comprising catalytic chemical conversion of hydrocarbons".[1] The claims presented by the applicant Flook for examination by the Patent Office are all directed to:

> A method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the catalytic chemical conversion of hydrocarbons . . .[2]

In further defining his invention, the applicant Flook employs mathematical formulas to describe an algorithm[3] which makes up part of the claimed method. As stated by the Court below:

---

1. Application of Dale R. Flook, filed October 29, 1971, App. 3A.

2. The preamble to Claim 1 and to each of dependent Claims 2 to 10. App. 63A.

3. The QUESTION PRESENTED, as stated by the Commissioner, characterizes this case as one in which "the patent applicant's sole inventive contribution is a mathematical algorithm to be conventionally implemented". Yet, the meaning of the uncommon term "algorithm" is nowhere explained. For purposes of clarity, respondent suggests that the following definition is appropriate:

> *Algorithm*, a set of steps designed to achieve a complex mathematical operation, each step carrying the operation forward by one small increment, and perhaps with the built in repetition of a step or set of steps until certain conditions are reached.

The New Encyclopedia Brittanica 239 (1974).

> The issue in this case is whether a claim to a process which *uses* an algorithm to modify a conventional manufacturing system is statutory subject matter . . .

Application of Flook, 559 F. 2d 21, 22 (C. C. P. A. 1977).

The statutory provision to be applied is clear and explicit:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U. S. C. § 101 (1952).

The applicant Flook concedes that he did not invent, and asserts that he does not seek to patent or to otherwise preempt, a "mathematical algorithm" for merely solving a mathematical equation. What the applicant Flook did invent and does seek to patent is a method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the catalytic chemical conversion of hydrocarbons. The subject matter is specific and precise. In describing that subject matter, algebraic symbols and equations have been used as a means of expression and definition. Indeed, such means of definition are both appropriate and customary. The Patent Office's own Rules of Practice expressly so provide.[4] Such mathematical formulas are not, and are not intended by the applicant Flook to be, the expressions of broad, abstract principles. The algebraic symbols used represent precise names given to real and measurable quantities and not mere abstractions.[5] Those quantities govern the specific operation of a particular alarm system as it monitors the performance and safety of a catalytic conversion facility.

4. "The specification, including the claims, may contain chemical and mathematical formulas . . ." 37 C. F. R. § 1.58 (1977).

5. As defined by the claims and the supporting disclosure of the patent application: Bo is the current alarm base; K is a predetermined alarm offset; PVL is the present value of the process variable involved in a process comprising the catalytic conversion of hydrocarbons; B_1 is a new alarm base to be determined; and F is a predetermined number greater than zero and less than 1.0.

The use of mathematical language in the claiming of the invention by the applicant Flook serves to particularly point out and distinctly claim the method disclosed.[6] The claims do not include method language in order to claim indirectly, or in practical effect, mathematics.

II. The Commissioner Seeks to Burden Section 101 with a Requirement for "Invention", Unintended by Congress for That Provision of Title 35, as a Device for Evading the Statutory Duty of Examination for Invention Under the Other Conditions and Requirements of the Patent Law.

The QUESTION PRESENTED here by the Commissioner[7] poses an unfair issue, and seeks to compel its own self-serving answer. Under the guise of the Section 101 definition of *categories* of subject matter which can be patented, the Commissioner has presented an issue of inventiveness on grounds which are wholly outside that statutory provision. The improper characterizations in the QUESTION PRESENTED, such as "sole inventive contribution . . . conventionally implemented",

6. 35 U. S. C. § 112 (1952) provides:

> . . .
>
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention. A claim may be written in independent or dependent form, and if in dependent form, it shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim.
>
> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

7. Whether a method is patentable subject matter under 35 U. S. C. 101 when the patent applicant's sole *inventive* contribution consists of a mathematical algorithm to be *conventionally* implemented, preferably in a *standard* general-purpose digital computer, and applied to control *existing* manufacturing processes.

Brief for the Petitioner at 2. (Emphasis added.)

do not properly arise, either administratively or judicially, under Section 101. The applicant Flook suggests that the QUESTION has been improperly infused by the Commissioner with standards of invention that must be and can only be treated by appropriate patent application examination and rejection, based on supported Patent Office showings of lack of novelty under Section 102 or non-obviousness under Section 103. The Patent Office has improvidently applied an unwarranted and statutorily unauthorized administrative policy[8] in this case, and has rejected the Flook application, not on its inventive merit as measured by Sections 102 and 103, but upon the *ipse dixit* that the claimed method is non-statutory subject matter under Section 101. Yet, the only factual basis for such a rejection is the use by the applicant Flook of mathematical equations in the definition of the method invention claimed.

More precisely, in addition to the "category" test of Section 101, the statutory conditions and requirements for patentability of a new and useful process (or method) included the requirements for novelty and the avoidance of a loss of the right to patent, as specified by Section 102 of Title 35. This record does not establish any rejection, or any basis for rejection, of the patentability of the subject claimed under 35 U. S. C. § 102.

A further condition and requirement of Title 35, and one of special importance in the light of the arguments and contentions now made by the Commissioner, is that of non-obvious subject matter, as required under Section 103. The record in this case

8. Applicant's patent application was filed on October 29, 1971 (App. 3A). Following this Court's November 20, 1972 decision in *Gottschalk* v. *Benson*, 409 U. S. 63, the Patent Office examining corps was instructed to review all pending and allowed applications, including those in which final issue fees had been paid, for possible application of the *Benson* decision and that *"all doubts will be resolved against the applicant"*. "Patent Office States Tentative Policy on Computer Programs", 106 Pat. T.M. Copyright Journal (BNA), December 7, 1972. Thereafter, on September 24, 1973, applicant's claims 1-10, four of which had previously been rejected under Section 112 (a rejection later withdrawn, App. 46A), were rejected for the first time under Section 101 (App. 18A).

provides no basis for the Commissioner's implication that the subject matter as a whole, and as claimed by the applicant Flook, is disqualified from patentability by reason of obviousness. The Patent Office never rejected a single claim as lacking novelty or as being obvious.[9]

The Patent Statute expressly provides for examination[10] as to novelty and non-obvious subject matter. In this case, the Patent Office found applicant's invention to be unpatentable on one ground only:

> Claims 1-10 are rejected under 35 U.S.C. 101 as being drawn to an invention which is not one of the types of inventions set forth in 35 U.S.C. 101 as patentable under the statute.

App. 46A.

9. In any event, since the Board concluded that respondent's claims did not contain patentable subject matter as defined in Section 101, it did not reach the question whether the process was barred from patentability by Section 103. Therefore, the question whether the claim embodied a sufficient advance over the prior art to merit a patent was not before the court below and is not before this Court.
Brief for the Petitioner at 14, n. 11.

The real reason the Board "did not reach" the question of obviousness was that there had *never* been a rejection by the Examiner under either Section 102 or 103 (App. 18A, 26A, 46A, 52A).

10. The Commissioner shall cause an examination to be made of the application and the alleged new invention; and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent therefor.
35 U. S. C. § 131.

> Whenever, on examination, any claim for patent is rejected, or any objection or requirement made, the Commissioner shall notify the applicant thereof, stating the reasons for such rejection, or objection or requirement, together with such information and references as may be useful in judgment of the propriety of continuing the prosecution of his application * * *.
35 U. S. C. § 132 (1952).

See also 35 U. S. C. §§ 6, 8 and 37 C. F. R. § 1.104-1.106 in the Appendix to this Brief.

The fact that the subject matter sought to be patented by the applicant Flook is a new[11] and useful[12] process (or method)[13] is not contested. Such subject matter qualifies for patentability, provided only that it fulfills the other conditions and requirements of Title 35, including particularly novelty and non-obvious subject matter. There has been no rejection of the claims by the Patent Office on the ground of lack of utility or of lack of novelty, or of non-obvious subject matter.[14] The Commissioner inflicts the mischief of confusion in this case by presenting a QUESTION, and by arguing, in terms loaded with language of purported anticipation and obviousness. This imposes a regrettable misconstruction upon a carefully-worded and highly-refined statute, and distorts[15] its otherwise clear meaning.

11. The Examiner evidently concluded that Respondent's mathematical formulae were novel (App. 26A, 48A-49A). We do not contest this conclusion.
Brief for Petitioner at 14, n. 12.

With respect to novelty, the Commissioner has asserted that "It is not disputed that, aside from the novel algorithm for computing updated alarm limits, every aspect of respondent's claimed invention is conventional and well-known in the art." (Brief for Petitioner at 7).

Actually, the applicant never conceded anything with respect to novelty, and never needed to, because there never was a rejection on the basis of a lack of novelty (see note 9, *supra*). All applicant ever conceded was that, *given applicant's teaching*, one of ordinary skill could practice the invention disclosed (*see*, for example, App. 21A-23A).

12. "The Examiner agrees that his invention is a technologically useful invention" App. 47 A.

13. The QUESTION PRESENTED, as stated by the Commissioner, is directed to whether "a method" is patentable subject matter under the conditions set forth. In the Petition for Writ of Certiorari herein, at 13 n. 17, it is acknowledged that within the context of 35 U. S. C. § 101:

> "Respondent's claims fall solely within the last of the four enumerated classes (processes or methods) . . ."

35 U. S. C. § 100 states that "The term 'process' means process, act or *method* . . ."

14. *See* note 9, *supra*.

15. For example, Section 101 makes no mention of a new and useful "advance", as improperly read into it by the Commissioner.

(Footnote continued on next page.)

The Patent Office has, improperly, injected considerations of inventiveness into the Section 101 definition of *categories* of patentable subject matter. The application of Section 101 is not dependent in any way upon non-obviousness. Yet, the Brief for the Petitioner is repetitive throughout with those expressions of language which are only properly applicable to the conditions and requirements of non-obvious subject matter under 35 U. S. C. § 103 (1952).[16]

The legislative history of the 1952 Patent Act, as explained in *Graham* v. *John Deere Co.*, 383 U. S. 1 (1966) makes it clear that Section 101 is not concerned with the presence or absence of "inventiveness". While it is correct to state that the 1952 Patent Act was intended by Congress to be merely a codification of judicial precedent, Congress did so by stating for the first time, in Section 103, a condition which had previously existed only by reason of Court decisions and not by statute.

The original Patent Act of 1790 provided that, "upon the petition of any person or persons . . . [who] . . . had invented

(Footnote continued from preceding page.)
The misstatement that processes under Section 101 are limited to "processes for making or using . . . machines, articles of [*sic*] manufacture, [or] composition of matter" so far departs from the precise language of Section 101 as to demonstrate that such distortion of the clear statutory language by the Commissioner is neither inadvertent nor incidental. Brief for the Petitioner, at 11.

16. The Brief for the Petitioner is improperly burdened with a litany of "invention" terminology inapplicable to and wholly absent from Section 101: "Advance over the prior art" (at 9); "must be implemented in an inventive manner" (at 10); "only the inventive use . . . warrants patent protection" (at 10); "predictable in light of the prior art" (at 13); "a novel and inventive manner" (at 14); "the non-inventive application of a mathematical result" (at 19); "must extend beyond the routine, conventional, or uninventive" (at 21); "new combinations of old elements are patentable only if they are inventive (at 21, n. 20); "inventive contribution" (at 22); "straightforward and conventional implementations" (at 22); and, "non-inventive computer applications" (at 24). Similarly, the inclusion of the Appendix at the conclusion of the Brief for Petitioner is an irregular excursion made entirely outside the record. The purported prior art there gratuitously discussed is uncited in the proceedings of record. The entirety of such inappropriate advocacy zeal may be disregarded by the Court.

or discovered any useful art, manufacture, engine, machine, or device, or any improvement therein not before known or used", a patent could be procured if the examining group found that "the invention or discovery [was] sufficiently useful and important". Patent Act of 1790, § 1, 1 Stat. 110. No standard of patentability beyond the bare requirements of novelty and utility was included in this earliest statutory test. Instead, it was left to the courts to determine and to evolve a judicial standard of "invention" for a patent grant. As stated by this Court in *Graham:*

> Although the Patent Act was amended, revised and codified some fifty times between 1790 and 1950, Congress steered clear of the statutory set of requirements other than the bare novelty and utility tests reformulated in Jefferson's draft of the 1793 Patent Act.

383 U. S. at 10.

Thus, it is seen that Section 101 has its genesis in the original statutory, minimum standard of "bare novelty", and is not concerned with the judicially-developed standard of "invention", now codified in Section 103. The Court made this important distinction clear in *Graham:*

The 1952 Patent Act:

> The act sets out the conditions of patentability in three sections. An analysis of the structure of these three sections indicates that patentability is dependent upon three explicit conditions: novelty and utility as articulated and defined in § 101 and § 102, and non-obviousness, the new statutory formulation as set out in § 103. The first two sections, which trace closely the 1874 codifications, express the "new and useful" tests which have always existed in the statutory scheme and, for our purposes here, need no clarification.

383 U. S. at 12.

It is submitted that the adoption of the views expressed by the Commissioner, that Section 103 considerations of "invention" are also proper considerations under Section 101, would unnecessarily confuse the law, and represent a serious setback in the search for standards which this Court, the lower courts,

and Congress undertook for more than 160 years, and which was finally culminated in the 1952 Patent Act.

It should not be thought that the Commissioner has merely failed to rely on the correct section of the statute through inadvertence or mistake, and that the result he urges could have been obtained by relying instead on Section 103. The result which the Commissioner seems to seek is the avoidance of the patent examination process altogether in mathematically defined inventions, even though, as this Court made clear in *Graham*, "the primary responsibility for sifting out unpatentable material lies in the Patent Office".[17]

III. The Commissioner's Rejection of Applicant's Claims Is Not Supported by This Court's Prior Decision in Gottschalk v. Benson.

The Commissioner, in his effort to avoid examining selected patent applications on their merits, has not only muddled the clear meaning of Section 101, but also here seeks to expand this Court's limited holding in *Gottschalk* v. *Benson,* 409 U. S. 63 (1972) into a proposed rule of court law which would relegislate the Patent Statute to accommodate the administrative needs of the Patent Office. The Commissioner suggests that:

> To merit monopoly protection, it is not sufficient that a claim embody a concrete, tangible application of a mathematical or scientific principle; it must also extend beyond the routine, conventional, or uninventive applications that follow once the applicant possesses the idea.

Brief for the Petitioner at 19.

Such a rule would mean, of course, that any inventor whose mental conception of his invention precedes its "concrete, tangible application" could not obtain a patent.[18] In effect, the Commissioner suggests that an inventor's "ideas" are to be con-

17. 383 U. S. at 18.

18. Congress clearly had no such rule in mind when it enacted 35 U. S. C. § 102(g) (1952):

(Footnote continued on next page.)

sidered as if they were in themselves "prior art", and that after "the applicant possesses the idea", he is then required to do something else "beyond the routine, conventional, or uninventive" in applying his idea. The rule of law proposed would empower the Commissioner to selectively elect the classes of claimed inventions to be examined by the Patent Office, and to peremptorily reject as "non-statutory" those inventions of complexity or subtlety which may fall outside the present system for effective review by the Patent Office. (See Brief for the Petitioner at 24, note 23.)

It is submitted that this Court did not intend to mandate in *Benson* a sweeping rule that one cannot, in practical effect, patent *any* so-called "idea". The misplaced reliance by the Commissioner upon the "nutshell" of a single short sentence of the Opinion in *Benson*, without regard to the reasons following it, is unfair to the Court and to the public. The full context must be considered:

> What we come down to in a nutshell is the following:
>
> It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula for converting BCD numerals to pure binary numerals were patented *in this case*. The mathematical *formula involved here* has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself.

409 U. S. at 71 (Emphasis added).

It is appropriate to ask: What was it about the "formula" in *Benson* that persuaded the Court to conclude that it should not

(Footnote continued from preceding page.)

> "In determining priority of invention there shall be considered . . . the respective dates of conception *and* reduction to practice of the invention . . ." (Emphasis added.)

Conception means "the formation in the mind of the inventor of a definite and permanent *idea* of the complete and operative invention as it is to be applied in practice." (Emphasis added.) *Townsend* v. *Smith*, 36 F. 2d 292, 295 (C. C. P. A. 1929).

be the subject of patent protection? It is suggested that the *Benson* Court made clear the principle being applied, when it observed:

> As we stated in Funk Bros. Seed Co. v. Kalo Co., 333 U.S. 127, 130, 68 S.Ct. 440, 441, 92 L.Ed. 588, "He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from the application of the law of nature to a new and useful end." We dealt there with a "product" claim, while the present case deals with a "process" claim. But *we think the same principle applies.*

409 U. S. at 69 (Emphasis added).

An analysis of the facts before the Court in the 1948 *Funk Bros.* case reveals that, had the 1952 Patent Act been applied, the patentee's claim[19] would quite properly have failed, not because he had discovered a "phenomenon of nature" but because he had *claimed an old composition of matter*. The *Funk Bros.* decision, as well as numerous other decisions which have been improperly characterized by the Commissioner,[20] merely hold that one who discovers the scientific explanation of why *pre-existing* compositions, machines and processes behave as they do, cannot claim the *old* subject matter as a *new* invention.[21]

In *Benson*, the applicants' process claims were unpatentable for precisely the same reason. In that case, the patent applicants had claimed a method for converting binary-coded-decimal

19. *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U. S. 127, 128, n. 1 (1948).

20. These decisions include: *Davison Chemical Corp.* v. *Joliet Chemicals*, 179 F. 2d 793 (7th Cir. 1950); *Armour Pharmaceutical Co.* v. *Richardson-Merrell, Inc.*, 396 F.2d 70 (3rd Cir. 1968); *National Lead Co.* v. *Western Lead Products Co.*, 324 F.2d 539 (9th Cir. 1963); and *Templeton Patents, Ltd.* v. *J. R. Simplot Co.*, 336 F.2d 261 (9th Cir., 1964).

21. Similarly, claims drawn to cover an *old* product of a *new* process are unpatentable. *Risdon Iron & Locomotive Works* v. *Medart*, 158 U. S. 68 (1895); *Cochrane* v. *Badische Analin & Soda Fabrik*, 111 U. S. 293 (1884); and *American Wood Paper Co.* v. *Fiber Disintegrating Co.*, 90 U. S. (23 Wall) 566 (1874).

(BCD) numerals into pure binary numerals. The claims set forth an algorithm, that is a "set of steps", for carrying out the conversion. The algorithm, though described in words, could equally well have been expressed as a formula stating the logical relationship between BCD and binary. However, even if newly discovered, that relationship was necessarily old because both numbering systems had concededly long been in use. Thus, a patent covering the "method" would, in practical effect, have covered the *old* relationship between the two *old* numbering systems.[22]

How then does the algorithm (set of steps) used by the applicant Flook differ from the algorithm before the Court in *Benson?* The answer is, in two important ways:

First, the formulas set forth in the claims now before the Court do *not* describe a relationship between pre-existing quantities. Until the applicant's method was first practiced, the quantities employed to monitor the process variable, as those quantities are defined in applicant's claims, had never existed. There is thus no attempt here to preempt, in practical effect or otherwise, the use of an old but previously undiscovered relationship between pre-existing quantities.[23]

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22. The same thing can be said of other mathematically-expressable relationships which have been cited to the Court as examples of things unpatentable. Einstein's famous $E=MC^2$ described for the first time the relationship between energy and mass. Yet, though newly discovered, the relationship itself was not new. E had always equalled MC^2. There had always been an immense amount of energy locked up in mass. Likewise, Newton's formula $F=MA$ merely described the natural (and old) relationship between pre-existing quantities: force, mass and acceleration. The Pythagorean Theorem $H^2=A^2+B^2$ merely described the relationship between the length of the hypotenuse and the lengths of the other two sides of a right-triangle, a relationship as old as the right-triangle itself.

23. As in *Smith* v. *Snow*, 294 U. S. 1 (1935) and *Waxham* v. *Smith*, 294 U. S. 20 (1935), the applicant Flook has "secured the performance of the function by a means which had never occurred in nature and [has] not been anticipated by the prior art; this is a patentable method or process." 294 U. S. 20, 22.

Second, as the Court below found:

> The present claims do not pre-empt the formula or algorithm contained therein, because solution of the algorithm, per se, would not infringe the claims. Thus, *Benson's* holding does not render the claims before us unpatentable.

Application of Flook, 559 F. 2d 21, 23 (CCPA 1977).

In commenting on the totally preemptive character of the quite different *Benson* claims, this Court observed that:

> Here the "process" claim is so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion. The end used may (1) vary from the operation of a train to verification of drivers' licenses to researching the law books for precedents and (2) be performed through any existing machinery or future-devised machinery or without any apparatus.

409 U. S. 63, 68.

In this case, the Commissioner has suggested (without any basis in the record) that the formulas used in applicant's claims belong to a class of:

> smoothing functions [which] are commonly used in business and manufacturing applications to correct for variation in the predicted performance of the variables that are being observed or controlled, such as speed, temperature, amount of inventory in stock, orbits for satellites, missile positions, rainfall, etc.[24]

Assuming, for the sake of argument, the correctness of the Commissioner's statement, such prior uses would obviously not be in any way encompassed or preempted by applicant's claims which are directed solely to "a method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the catalytic conversion of hydrocarbons . . . ."[25]

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24. Appendix at 8A, included in the Brief for the Petitioner.

25. *Supra*, note 2.

The invention which applicant has disclosed and claimed is thus fully distinguishable from the subject matter before the *Benson* Court. Applicant in no way seeks to patent or preempt a formula or an algorithm for merely solving an equation, nor does he seek to patent both new and future uses of a formula, nor anything that is in fact *old* though previously undiscovered.

Applicant asks only that his invention be declared to be what the record and the law shows it to be: a new and useful method within the meaning of 35 U. S. C. § 101.

CONCLUSION.

The Commissioner seeks from this Court a judicial license to avoid his duty to examine *any* claimed inventions which may involve, in whole or in part, computer applications of mathematical algorithms, merely because such examination "would impose a substantial additional burden on the Patent Office."[26] The Commissioner's attempt to confuse the clear meaning of Section 101 and to extend this Court's limited holding in *Benson* for that improper purpose should not succeed, and the judgment of the Court below should be affirmed.

Respectfully submitted,

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April 6, 1978

26. Brief for the Petitioner at 24, note 23.

APPENDIX.

United States Constitution, Statutes and Regulations.

THE CONSTITUTIONAL PROVISION.

ART. 1, SEC. 8. The Congress shall have power . . . To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.

UNITED STATES CODE
TITLE 35—PATENTS

Patent Act of
July 19, 1952, C. 950,
§ 1, 66 Stat. 792.

CHAPTER 1—ESTABLISHMENT, OFFICERS, FUNCTIONS

§ 6. Duties of Commissioner

The Commissioner, under the direction of the Secretary of Commerce, shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trade-marks; and he shall have charge of property belonging to the Patent Office. He may, subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent Office.

§8. Library

The Commissioner shall maintain a library of scientific and other works and periodicals, both foreign and domestic, in the Patent Office to aid the officers in the discharge of their duties.

Chapter 10—Patentability of Inventions

§ 100. Definitions

When used in this title unless the context otherwise indicates—

(a) The term "invention" means invention or discovery.

(b) The term "process" means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

(c) The terms "United States" and "this country" mean the United States of America, its territories and possessions.

(d) The word "patentee" includes not only the patentee to whom the patent was issued but also the successors in title to the patentee.

§ 101. Inventions patentable

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

§ 102. Conditions for patentability; novelty and loss of right to patent

A person shall be entitled to a patent unless—

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

(c) he has abandoned the invention, or

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application filed more than twelve months before the filing of the application in the United States, or

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or

(f) he did not himself invent the subject matter sought to be patented, or

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other. (Amended July 28, 1972, Public Law 92-358, Sec. 2, 86 Stat. 501.)

§ 103. Conditions for patentability; non-obvious subject matter

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Chapter 11—Application for Patent

§ 112. Specification

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention. A claim may be written in independent or dependent form, and if in dependent form, it shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim.

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. (Amended July 24, 1965, Public Law 89-83, sec. 9, 79 Stat. 261.)

Chapter 12—Examination of Application

§ 131. Examination of application

The Commissioner shall cause an examination to be made of the application and the alleged new invention; and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent therefor.

§ 132. Notice of rejection; reexamination

Whenever, on examination, any claim for a patent is rejected, or any objection or requirement made, the Commissioner shall notify the applicant thereof, stating the reasons for such rejection, or objection or requirement, together with such information and references as may be useful in judging of the propriety of continuing the prosecution of his application.

CODE OF FEDERAL REGULATIONS

Title 37—Patents, Trademarks, and Copyrights

§ 1.58. Chemical and mathematical formulas and tables.

(a) The specification, including the claims, may contain chemical and mathematical formulas, but shall not contain drawings or flow diagrams. The description portion of the specification may contain tables; claims may contain tables only if necessary to conform to 35 U. S. C. 112.

(b) All tables and chemical and mathematical formulas in the specification, including claims, and amendments thereto, must be on pure white durable paper, the surface of which is calendered and smooth, in order to permit use as camera copy when printing any patent which may issue. A good grade of bond paper is acceptable; watermarks should not be prominent. India ink or its equivalent, or solid black typewriter ribbon must be used to secure perfectly black solid lines.

(c) To facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 5 inches (12.7 cm.) so that it may appear as a single column in the printed patent. If it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissable to present the formula or table with a maximum width of 10¾ inches (27.3 cm.) and to place it sideways on the sheet, in which case the formula or table will appear printed across both

columns of the page in the printed patent. Typewritten characters used in such formulas and tables must be from a block (nonscript) type font or lettering style having capital letters which are at least 0.085 inch (2.2 mm.) high (elite type). Hand lettering must be neat, clean, and have a minimum character height of 0.085 inch (2.2 mm.). A space at least ¼ inch (6.4 mm.) high should be provided between the formulas and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with high degree of legibility.

§ 1.104. Nature of examination; examiner's action.

(a) On taking up an application for examination, the examiner shall make a thorough study thereof and shall make a thorough investigation of the available prior art relating to the subject matter of the invention sought to be patented. The examination shall be complete with respect both to compliance of the application with the statutes and rules and to the patentability of the invention as claimed, as well as with respect to matters of form, unless otherwise indicated.

(b) The applicant will be notified of the examiner's action. The reasons for any adverse action of any objection or requirement will be stated and such information or references will be given as may be useful in aiding the applicant to judge of the propriety of continuing the prosecution of his application.

§ 1.105. Completeness of examiner's action.

The examiner's action will be complete as to all matters, except that in appropriate circumstances, such as misjoinder of invention, fundamental defects in the application, and the like, the action of the examiner may be limited to such matters before further action is made. However, matters of form need not be raised by the examiner until a claim is found allowable.

§ 1.106. Rejection of claims.

(a) If the invention is not considered patentable, or not considered patentable as claimed, the claims, or those considered unpatentable will be rejected.

(b) In rejecting claims for want of novelty or for obviousness, the examiner must cite the best references at his command. When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified.